

PORTLAND HARBOR STORMWATER MODELING  
SUMMARY OF RESULTS FOR PCB-118

[DRAFT 6/12/07]

SUMMARY OF RESULTS FOR PCB-118	MODEL SETTINGS				MODEL RESULTS (ug kg <sup>-1</sup> )						
	UPSTRM. CONC.	ATMOS. DEP.	SED. CONC.	SW CONC.	SEDIMENT CONC.			FISH TISSUE CONC.			
Effects of Upstream* and Atmospheric Deposition** to the Harbor					Mainstem	Lagoon	SLV <sup>1</sup>	Mainstem	Lagoon	ATL for PCB-118 <sup>2</sup>	FCAV for Total PCBs <sup>3</sup>
1. How could upstream sources alone impact contaminant levels in fish, assuming “clean” sediment and no other sources? Sediment concentrations would be below the SLV. Harbor-wide mean fish tissue concentrations would exceed the ATL in the mainstem but not the lagoon.	0.01 ng L <sup>-1</sup>	0	0	0	0.0013 ± 0.0005	0.0004	0.19	3.97 ± 0.69	0.12	2.1	5.9
2. How could atmospheric deposition to water and land within the harbor's watershed impact contaminant levels in sediment and fish, assuming “clean” sediment and no other sources? Atmospheric deposition appears to have no significant impact on sediments and result in a negligible increase in fish tissue concentrations in mainstem. In the lagoon, however, it results in an exceedence of the ATL and FCAV.	0	Per Model	0	0	1.4×10 <sup>-5</sup> ± 0.9×10 <sup>-5</sup>	0.003	0.19	0.04 ± 0.02	6.4	2.1	5.9
3. How could upstream sources AND atmospheric deposition to the harbor impact contaminant levels in sediment and fish, assuming “clean” sediment and no other sources? Fish tissue screening levels are exceeded in both the mainstem and the lagoon. However, as indicated in the scenarios above, the exceedences are driven by different sources.	0.01 ng L <sup>-1</sup>	Per Model	0	0	0.0013 ± 0.0005	0.003	0.19	4.01 ± 0.71	6.71	2.1	5.9
Back Calculating Hypothetical Stormwater Loads											
4. What is the maximum concentration of PCB-118 in stormwater that would not cause an exceedance of an acceptable SEDIMENT level in the mainstem, assuming continuing upstream and atmospheric sources and clean sediment? The model estimates that the sediment SLV would not be exceeded in the mainstem unless the concentration of PCB-118 in stormwater was greater than 125 ng L-1. However, this would result in an exceedance of the sediment SLV in the lagoon and highly elevated fish tissue concentrations throughout the harbor.	0.01 ng L <sup>-1</sup>	Per Model	0	125 ng L <sup>-1</sup>	0.04 ± 0.04	1.5	0.19	110.1 ± 96.1	4429	2.1	5.9
5. What is the maximum concentration of PCB-118 in stormwater that would not cause an exceedance of a FISH CONSUMPTION ADVISORY in the mainstem, assuming continuing upstream and atmospheric sources and clean sediment? Because upstream and atmospheric sources already result in an exceedance of the ATL, there is no capacity for additional PCB loading from stormwater.	0.01 ng L <sup>-1</sup>	Per Model	0	0	n/a	n/a	0.19	4.01 ± 0.71	6.71	2.1	5.9
Effect of Existing Sediment Contamination											
6. How do currently observed sediment concentrations impact contaminant levels in fish, assuming continuing upstream and atmospheric sources but no land-based stormwater sources? [Both modeled and observed values are presented.] The model indicates that the combination of upstream, atmospheric and current sediment loads results in an order of magnitude exceedance of the ATL. Note that this scenario does not include any additional PCBs in stormwater that might originate from local (vs. atmospheric) sources.	0.01 ng L-1	Per Model	Current conc.	0	22.2 ± 81.1	8.4	0.19	42.3 ± 141.3	20.9	2.1	5.9
					Observed:			Observed:			
					16.7 ± 44.5	8.8		31.2 ± 14.9	40.5 ± 20.3		
Effect of Cleaning Up Sediment to the SLV											
7. If sediments were cleaned up to the SLV, how would this affect contaminant levels in fish, assuming continuing upstream and atmospheric sources but no land-based stormwater sources? The model estimates that this would result in an order of magnitude reduction in fish tissue concentrations as compared with current (modeled) tissue concentrations. Fish tissue concentrations in the main river would still exceed the ATL but be below the FCAV, and would exceed both the ATL and FCAV in the lagoon.	0.01 ng L <sup>-1</sup>	Per model	0.12 (SLV)	0	0.12 ± 0.002	0.12	0.19	4.17 ± 0.69	6.86	2.1	5.9

Highlighted columns are screening level values (SLVs) for relevant media.

**Bolded** values indicate an exceedence of the corresponding screening value.

\*Upstream sources, i.e., the sources of PCBs found in river water entering the study area, include river sediments, atmospheric deposition and local anthropogenic sources.

\*\*Atmospheric deposition includes deposition of aerosol or gas phase contaminants directly to surface water and atmospheric deposition to land which is conveyed to the river by stormwater.

<sup>1</sup>SLV = Screening Level Value from DEQ's 2005 JSCS, Table 3-1

<sup>2</sup>ATL = Acceptable Tissue Level from DEQ's 2007 Bioaccumulative Guidance, Table A-3b

<sup>3</sup>FCAV = Fish Consumption Advisory Value from EPA's 2000 Guidance for Fish Consumption Advisories, Table 4-24